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Vol. 9, No. 3. WASHINGTON, D.C. October, 1939.

Accidents.

How to reduce farm accidents. By C. G. Chipchase. Farmers digest. v.2,no.6. October, 1938. p.16-19.

Agricultural Engineering.

Engineering indispensable in agriculture. By E. M. Freeman. Agricultural engineering. v.20,no.9. September, 1939. p.339-340.

Agriculture.

Certain economic aspects of agriculture in the Jackson county soil-conservation area. By E. C. Weitzell. Morgantown, W. Va., 1939. 56p. West Virginia university. Agricultural experiment station. Bulletin no.291.

Air Conditioning.

Air conditioning featuring chemical dehumidification. By Stewart C. Coey. Refrigerating engineering. v.37,no.5. May, 1939. p.317-321. Dehumidifiers classified; controls classified; cost of operation.

Alcohol Fuel.

"Alky Gas" has many supporters. National petroleum news. v.31,no.32. August 9, 1939. p.20-21. Discusses proposed legislation.

Motor fuel alcohol is misrepresented Ill. jobbers charge. National petroleum news. v.31,no.31. August 2, 1939. p.13. That alcohol for blending with gasoline for motor fuel is falsely represented as being product of domestic farm crops, to catch eye of the farm trade, on theory that farmers will be more inclined to use product, is charged by Illinois Petroleum Marketers Ass'n.

Barns.

What will a new barn cost? By Deane G. Carter. Progressive farmer. v.54,no.2. February, 1939. p.16.

Boilers.

Latest developments of the Benson boiler. By Francis Hodgkinson. Mechanical engineering. v.61,no.4. April, 1939. p.287-294. II--Description of typical installations.

Revisions and addenda to boiler construction code. Mechanical engineering. v.61,no.5. May, 1939. p.398-401.

Brooders, Electric.

Thermal characteristics of electric brooders. By John E. Nicholas and E. W. Callenbach. Agricultural engineering. v.20,no.8. August, 1939. p.313-315.

Building Construction.

Beam constants for continuous trusses and beams: discussion. By Leo Legens. American society of civil engineers. Proceedings. v.65,no.4. April, 1939. p.683-685.

Earthquakes and structures: discussion. By R. S. Chew and others. American society of civil engineers. Proceedings. v.65,no.4. April, 1939. p.721-728.

Earthquakes and structures: discussion. By A. A. Eremin. American society of civil engineers. Proceedings. v.65,no.6. June, 1939. p.1155.

How to estimate accurately. By J. Douglas Wilson. American builder and building age. v.61,no.8. August, 1939. p.72-74,104. Estimating, ceilings, roofs and stairs are discussed.

Purpose of preparing the National building code. By A. F. Gill. Canadian engineer. v.76,no.13. March 28, 1939. p.8-10. Canada's code provides proper minimum design standards, insures adequate safeguards against damage and assures that completed buildings will provide sanitary and healthy quarters.

Simplified wind-stress analysis of tall buildings: discussion. By Samuel T. Carpenter. American society of civil engineers. Proceedings. v.65,no.4. April, 1939. p.729-730.

Simplified wind-stress analysis of tall buildings: discussion. By Charles B. Winick. American society of civil engineers. Proceedings. v.65,no.6. June, 1939. p.1081-1086.

Wind bracing in steel buildings: sixth progress report of subcommittee no.31 committee on steel of the structural division. American society of civil engineers. Proceedings. v.65,no.6. June, 1939. p.969-1000. Consideration of following: (A) Approximate methods of determining the column wind reactions

Building Construction. (Cont'd).

from a consideration of member stiffnesses only; (B) the effect of direct deformation in columns on stresses in a wind bent; (C) torsional effects of wind on buildings; and (D) magnitude of assumed wind force on tall buildings.

Wind forces on a tall building: discussion. By Colin Skinner. American society of civil engineers. Proceedings. v.65,no.6. June, 1939. p.1024-1036.

Building Materials.

Possibilities for utilization of pulverized-coal ash: letters from Raymond E. Davis, J. R. James, A. W. Thorson, John S. Nelles. Mechanical engineering. v.61,no.6. June, 1939. p.475-477.

Reducing weight of concrete storage bins. Grain and feed journals. v.82,no.11. June 14, 1939. p.487. Burned clays such as Haydite, Gravelite, Lytag and Vesicullite are lighter than crushed stone and may be used in aggregate of concrete mixtures to reduce weight on the foundation, without any disadvantage other than increased cost.

Steel for economy and durability. By Lao J. Brosemer. Breeder's gazette. v.104,no.6,2534. June, 1939. p.8-9.

Canals.

All-American canal. By T. A. Clark and C. A. Pugh. Reclamation era. v.29,no.7. July, 1939. p.159-162.

Cast Iron.

History of cast iron pipe. By William R. Conard. New England water works association. Journal. v.53,no.2. June, 1939. p.166-170.

Some engineering aspects of cast iron. By Carl H. Morken. Mechanical engineering. v.61,no.6. June, 1939. p.455-459.

Concrete.

Aggregate selection and concrete mix design. By Charles E. Wuerpel. Civil engineering. v.9,no.9. September, 1939. p.539-542. Comments on vibration compaction and water curing.

Protective coating for concrete placed in forms before pouring. Engineering news-record. v.122,no.23. June 8, 1939. p.85-86. Salt water attacks on under sides of wharves in San Francisco Bay prevented by pre-treatment of beam and slab surfaces.

Condensation.

Condensation problems in farm buildings. By L. V. Teesdale. Agricultural engineering. v.20,no.9. September, 1939. p.353-356.

Corrosion.

Pitting corrosion of cast-iron and steel pipes. By Ing. Ludvik Olsanský. Engineering. v.147,no.3833. June 30, 1939. p.787. From tests conclusions can be drawn:--(1) general opinion as to importance of as-cast skin for increasing resistance of cast-iron pipes to corrosion is sound one; (2) scale (magnetic oxide) formed during rolling has same importance for increasing resistance of steel pipes to corrosion as as-cast skin in case of cast-iron pipes; (3) outer layer of material of pipes situated immediately beneath as-cast skin, or beneath scale, is much more resistant than internal layers; (4) as-cast skin or scale and surface layers situated directly behind them, at those places which are opposite to points where corrosion began, have no influence on resistance to corrosion; (5) it is only desirable to make comparative test on cast-iron or steel pipes with unmachined surfaces, i.e., as they are used for laying gas mains; (6) it is impossible to evaluate resistance of cast-iron and steel pipes to corrosion on basis of machined cylinders.

Cotton.

Apparatus for measurements of lengths of cotton fibers. By Burt Johnson. Fayetteville, Ark., 1939. 22p. "Literature": p.22. University of Arkansas. Agricultural experiment station. Bulletin no.381.

Cotton research foundation becomes division of cotton council. Cotton and cotton oil press. v.40,no.18. July 8, 1939. p.8. National Cotton Council now has agreement under which Cotton research foundation will become research division of Council. New affiliation became effective on July 1. Operating through multiple fellowships in Mellon Institute of Industrial research. Foundation will continue its present exploratory program and in addition will handle all matters of scientific research arising out of activities of National Council. Cotton Research Foundation summarizes its purposes thus:"(1) To originate basic new uses for cotton plant, (2) to stop trend away from cotton to substitutes."

Possible methods for increasing the consumption of cotton and cotton by-products. By A. R. Macormac and C. A. Basore. Auburn, Ala., 1939. 13p. "Bibliography", p.13. Alabama polytechnic institute. Engineering experiment station. Bulletin no.9.

Cotton Gins and Ginning.

Contributions from members of the Bureaus of Agricultural engineering and Agricultural economics on subjects relating to cotton fiber, ginning and spinning studies released to the public. Washington, U.S. Department of agriculture. 1939. 11p. Mimeographed.

Cost of steam gin operation. By Orville Adams. Cotton and cotton oil press. v.40,no.18. July 8, 1939. p.9,12.

Cotton Machinery.

Cotton dusting machinery. By H. P. Smith. Farm and ranch. v.58,no.5. May, 1939. p.18-19. Discusses type of machine, number of acres of cotton each type will handle, whether the machines will handle sulphur, sulphur-calcium arsenate mixtures, and calcium arsenate equally well, whether dusting is better than spraying, and average cost of machine.

Dairy Farm Equipment.

Economics of machine-milking. By A. Bridges. Journal of the Ministry of agriculture. v.46,no.1. April, 1939. p.63-72. Table IV. Cost of labour in milk production on herds milked (a) by machine, and (b) by hand. Table V. Net farm costs in milk production on herds milked (a) by machine and (b) by hand. Table VI. Labour costs on 24 herds before and after the installation of milking machines. Table VII. Costs of running and upkeep of milking machines.

Some pointers on dairy farm equipment. By J. C. Scott. Electricity on the farm. v.12,no.9. September, 1939. p.7-8. What size motor for the silo filler, hay hoist and wood saw; a multi-purpose electric water heater.

Dams.

Design and maintenance of earth dams. By William P. Creager. American water works association. Journal. v.31,no.8. August, 1939. p.1335-1360. Paper is intended to describe primarily basic principles involved in maintenance of earth dams.

Designing and building Dannebrog Lake Dam. By L. R. Rudd. Public works. v.70,no.5. May, 1939. p.17-18. Small dam but with some interesting features--made of reinforced concrete supported by steel sheetpiling; much of work done from a highway bridge a few feet up stream from dam; all concreting in freezing weather.

Grouting to prevent leakage around an earth dam. Public works. v.70,no.7. July, 1939. p.12-14,36,38. Leakage of

Dams. (Cont'd).

over 1,000 gpm below an earth dam was thought to be around one end of core wall. By exploratory drilling and pumping in grout under high pressure (meantime developing a procedure that is explained), the leakage was practically eliminated.

Pensacola project, Oklahoma. By E. Lawrence Chandler. Civil engineering. v.9,no.9. September, 1939. p.529-532. Multiple-arch dam, now under construction, is first unit in development of Grand River. Gives brief general description of project, and then takes up in more detail methods employed in construction. Of particular interest are preparation of foundations for arches and buttresses, and highly flexible arrangements for handling forms and concrete.

Refacing Stevenson Dam. Engineering news-record. v.123,no.7. August 17, 1939. p.58-60. Because of extensive surface disintegration of concrete on downstream face of Stevenson Dam, main hydro station of Connecticut Light & Power Co., the dam is being repaired by drainage and refacing. Plan of repair work is based on experience in taking care of seepage water during repair of Tunnel Dam near Norwich, but system of drains at Stevenson is more complete.

Water pressure indicators for use in earth dams. By David R. May. Engineering news-record. v.123,no.7. August 17, 1939. p.52-53. Pressure cells with sensitive gold plated diaphragms replace wells in obtaining saturation lines and other hydraulic conditions within earth dams.

Drainage.

Ontario stream control. By S. W. Archibald. Canadian engineer. v.76,no.14. April 4, 1939. p.9-14. Investigation of application of drainage acts of Province of Ontario to problem of flood control and damage prevention.

Precast liners for drainage ditches. Engineering news-record. v.123,no.7. August 17, 1939. p.71-72. Ditch lined with these slabs requires practically no maintenance and lining eliminates possibility of standing pools of water. Furthermore, cost is considerably less than linings heretofore employed.

Dryers and Drying.

Alfalfa dehydrating plant in Nebraska. Grain and feed journals. v.82,no.11. June 14, 1939. p.507. Dehydrating plant consists of heat producing unit, fired with oil, connection between this unit and rotary drier, vacuum producing fan that draws heated air from heater thru drier, collector in which hay is cooled, hammer mill and meal collector from which completed product may be sacked.

Dryers and Drying. (Cont'd).

Curing hay in the barn. By C. E. Wylie. Hoard's dairyman. v.83,no.9. May 10, 1939. p.281,288. Describes new method of drying hay, that is, to dry it by use of air in barn without heat. This new process of drying hay in barn has been developed over period of four years at University of Tenn. It has been cooperative project with Tenn. Valley Authority. It is part of great regional planning project in soil conservation and rural electrification.

Factors in choosing a rotary dryer. By H. W. Harrigan and J. A. Boyd. Chemical and metallurgical engineering. v.46,no.4. April, 1939. p.214-217. References: p.217. Most industrial thermic drying is done by one of five methods: spray, drum, tunnel, rotary vacuum or rotary atmospheric. The last named is the method discussed here. All of the salient features and many of peculiarities, advantageous and otherwise, of several types of atmospheric rotary dryers are covered in detail.

Electric Lines.

Inductive coordination of rural power and telephone lines. By H. R. Huntley and J. O'R. Coleman. Edison electric institute bulletin. v.7,no.8. August, 1939. p.397-400,423. Problem is location, design, operation and maintenance of the two types of systems so as to result in the best service of both at least overall cost to public.

Progress in rural load building. By H. E. Dexter. Rural electrification exchange. v.2,no.3(new series). Third quarter, 1939. p.49-52,56.

Electricity - Distribution.

Production and distribution of Bonneville power. By Bayard O. Wheeler. Journal of land and public utility economics. v.14,no.4. November, 1938. p.359-369.

Electricity on the Farm.

Electrical method for collecting semen from fur-bearing animals. By F. W. Duffee. Agricultural engineering. v.20,no.9. September, 1939. p.349-350.

Electricity for low-income farms brought nearer by REA development. Domestic commerce. v.24,no.7. September 10, 1939. p.120. Rural Electrification Administration has developed, in cooperation with several electrical equipment manufacturers, new devices and techniques by which low-income farmers may have electrical service at very low cost. New devices consist of small transformer, new gap for lightning protection, new type of circuit breaker, and underground wire from transformer to house

Electricity on the Farm. (Cont'd).

which serves both as conductor and as ground for credit. All of these pieces of equipment which constitute "service" are being produced and marketed at very low prices, bringing cost of electricity down to point where minimum bill of about $1 a month will provide revenue enough for amortization of cost.

Electrify your grindstone. By G. M. Foulkrod. New England homestead. v.112,no.14. July 15-29, 1939. p.6,14. Eliminates a lot of hand labor and turns out a better job in a shorter time. Gives diagram of one method of attaching v-belt drive to grindstone.

How electricity is used on the farm. By C. N. Turner. Ithaca, N.Y., 1939. 40 unnumb. p. Cornell university. New York state college of agriculture. Extension bulletin no.410. Illustrations.

REA--What it is, how it works. By Allen B. MacMurphy. Agricultural situation. v.23,no.8. August, 1939. p.19-21.

Survey report on uses of electricity in dairy and poultry industries. By Harry L. Garver. Agricultural engineering. v.20,no.9. September, 1939. p.341-344. Project has as its objective study of uses that will pay, or at least give promise of paying, their own way and perhaps also net profit, keeping in mind low-income farm. As building of rural power lines reaches less prosperous farmers, problem of finding or developing uses of electricity that aid in increasing income gets more and more exacting. Not only must equipment of readily adaptable and practical nature be developed, but studies must be made which will lay foundation for developing equipment for future.

Weak link in farm electrification. By H. J. Gallagher. Rural electrification exchange. v.2,no.3.(new series). Third quarter, 1939. p.55-56. Successful development of rural electrification is dependent upon four major factors of relatively equal importance. First: Extension of service into rural areas. Second: Production of equipment and appliances designed to meet farmers' needs. Third: Familiarizing farmer with uses and advantages of service. Fourth: Aggressive merchandising. In well balanced program, these four factors must keep pace with each other, but it has become more apparent through the years that rural electrification lacks balance because of lag in merchandising.

Engineering.

Benoît Fourneyron (1802-1867). By Frederic W. Keator. Mechanical engineering. v.61,no.4. April, 1939. p.295-301. Civil engineer of mines, Chevalier of the Legion of Honor, consulting industrial engineer, representative of the people in the constituent assembly, patriot, and pioneer in the scientific development of the Hydraulic turbine.

Engineering. (Cont'd).

Engineering training for the construction field. By Adolph J. Ackerman. Civil engineering. v.9,no.9. September, 1939. p.525-528. Outlines "basic enterprises of construction" served by engineer, and offers valuable suggestions for broadening opportunities.

Why so few famous engineers today? By Farley Gannett. Engineering news-record. v.123,no.7. August 17, 1939. p.66-67. In a thought-provoking discussion, Farley Gannett asks why so few engineers of today have attained fame comparable to that of many engineers of past decades and puts forward several of the most plausible explanations that have been suggested to him.

Erosion Control.

Comparison of two types of concrete slab structures for soil erosion control. By Horace J. Harper. Agricultural engineering. v.20,no.8. August, 1939. p.307-308.

Conserving soil by better land-use practices. By P. M. Barrett. East Lansing, Mich., 1939. 30p. Michigan state college. Extension bulletin no.203.

Erosion and related land use conditions on the Muskingum river watershed. By H. Howe Morse. Washington, U.S. Govt.print. off., 1939. 36p. U.S. Department of agriculture. Soil conservation service.

Soil defense of range and farm lands in the Southwest. By E. M. Rowalt. Washington, U.S. Govt.print.off., 1939. 51p. U.S. Department of agriculture. Miscellaneous publication no.338.

Evaporation.

Evaporation experiments. By Harold C. Hickman. American society of civil engineers. Proceedings. v.65,no.4. April, 1939. p.596-606. Evaporation experiments reported in paper were conducted at Duluth, Kewaunee, Detroit, and Buffalo, for purpose of providing basis for estimating evaporation from water surfaces of Great Lakes. In order to be applicable to local conditions, an effort was made to keep temperature of water in pans approximately same as temperature of water in open lakes. Data were secured which cover a greater variety of combinations of air and water temperatures and wind velocities at evaporation pans, than any known heretofore. In applying these data to Great Lakes it was assumed that evaporation from open lakes, for given air temperature, water temperature, and wind velocity, would be same as observed evaporation from experimental pans for same combination of air temperature, water temperature, and wind velocity. Readings were analyzed and plotted on two charts, from which estimate of monthly (or daily) evaporation from Great Lakes can be made. In these charts it has been assumed that relative humidity and

Evaporation. (Cont'd).

barometric pressure correspond to average conditions that existed on shores of lakes, at all four stations, during particular time of year in which data were being obtained. Experiments indicate that effect of wind on evaporation is fundamentally different from that indicated by common evaporation formula. Rate of evaporation from open-water surfaces when air temperature is below freezing has been investigated for first time.

Farm Buildings.

Farm building survey of three central states. American lumberman. No.3155. July 1, 1939. p.26.

Farmer looks at farm structures. By William A. Benitt. Agricultural engineering. v.20,no.8. August, 1939. p.303-306.

New farm homes and farm buildings among dealers' best 1939 prospects. American lumberman. No.3155. July 1, 1939. p.24-25. Results of a survey of farm building conditions in Iowa, Illinois and Ohio.

Farm Machinery and Equipment.

Harvester announces its new small farmall-A. Farm implement news. v.60,no.14. July 13, 1939. p.32-34.

Increasing use of the combine. By A. P. Brodell. Agricultural situation. v.23,no.8. August, 1939. p.14-16. Table gives acreage of wheat and oats harvested by specified methods, by geographical divisions, 1938.

Methods and machinery for harvesting soybeans. By J. W. Sjogren. Blacksburg, Va., 1939. 10p. "Literature cited": p.9. Virginia polytechnic institute. Bulletin no.319.

Model experiments on tillage tools. By Kalman J. DeJuhasz and A. W. Clyde. Instruments. v.12,no.5. May, 1939. p.144-146. Tentative outline is given for proposed construction of a "model testing trough" for study of tillage tools.

Power equipment for injecting carbon bisulfide into soil. By Orval C. French. Agricultural engineering. v.20,no.9. September, 1939. p.351-352,358.

Recent labour-saving devices. International sugar journal. v.41,no.488. August, 1939. p.298-300. Land clearing. Field preparation. Planting. Cultivating. Harvesting.

Royal agricultural show at Windsor. Engineering. v.147, no.3833. June 30, 1939. p.767-769.

Farm Machinery and Equipment. (Cont'd).

Royal agricultural show at Windsor. Engineering. v.148, no.3835. July 14, 1939. p.37-40.

Royal agricultural show at Windsor. Engineering. v.148, no.3836. July 21, 1939. p.71-74.

Sugar beet machinery at the Royal show. By W. J. West. British sugar beet review. v.13,no.5. August, 1939. p.137-138, 156. Drills, mechanical bunchers, horse-hoes, tractor hoes, row crop tractors, harvesting machinery.

Farmhouses.

FSA panel-builds home, barns for 50-acre farms to sell at $5,000. American lumberman. No.3154. June 17, 1939. p.36-37.

Farm engineers discuss dealer's place in improving home standards. American lumberman. No.3155. July 1, 1939. p.22-23,27. Essentials of house design for modern rural needs are outlined; profitableness of good buildings emphasized.

Housing the rural worker. By R. T. Shears. Journal of the Ministry of agriculture. v.46,no.4. July, 1939. p.318-329.

Relation of construction factors to comfort in farmhouses. An address by J. W. Simons of the U. S. Bureau of Agricultural engineering at the thirtieth annual meeting of the American home economics association, San Antonio, Texas, June 22, 1939. Washington, D. C., U.S. Department of agriculture. 12p. Mimeographed.

Fences.

Fence yourself in. Country life and the sportsman. v.76, no.1. May, 1939. p.90-92.

Fibers, Synthetic.

Cotton's synthetic rivals. By Carl H. Robinson. Agricultural situation. v.23,no.4. April, 1939. p.18-20. With exception of rayon, however, synthetic textile materials have not displaced significant quantity of cotton, whatever their potentialities may be.

"Lanital" the synthetic wool from milk, its process and its output. By Antonio Giordano. Rayon textile monthly. v.20,no.8. August, 1939. p.45-46.

Ten years' service experience with Alclad materials in aircraft. By Frederick C. Pyne. S.A.E. journal. v.44,no.5. May, 1939. p.221-228. Paper points to necessity for

Fibers, Synthetic. (Cont'd).

reliability in materials for aircraft construction and to increasingly pressing demand for more satisfactory and reliable materials to meet rapidly advancing performance requirements. It goes on to discuss how Alclad materials have come forward to meet these demands and tangible results obtained in so doing. Nature and technical characteristics of Alclad materials are described with particular emphasis placed on electrolytic processes which, to great extent, determine ability of these materials to resist corrosion. Laboratory, weather-exposure, and tidewater-immersion tests, demonstrating outstanding resistance to corrosion of Alclad materials, are cited.

Trends in man-made fiber development. By Harold Dewitt Smith. Rayon textile monthly. v.20,no.8. August, 1939. p.43-44.

Fire Protection.

Fire hazards of termite control. By Charles S. Morgan. National fire protection association. Quarterly. v.33,no.1. July, 1939. p.48-52. Discusses mechanical barriers.

Fireplaces.

Outdoor grilles and barbecue fireplaces. American builder and building age. v.61,no.8. August, 1939. p.70-71.

Flow of Water and Gases.

Flow of water in pipe grid systems. By Richard G. Tylor. Water works and sewerage. v.86,no.8. August, 1939. p.285-288.

Foods, Frozen.

Desiccation of frozen food. By Wm. J. Finnegan. Ice and refrigeration. v.97,no.2. August, 1939. p.111-113. Deterioration of frozen foods caused by various siccative conditions to which such foods are subjected during storage and distribution is one of major problems confronting industry. Factors contributing to these dehydrative conditions are numerous, and physical actions in each instance are too involved and varied to permit general discussion. Therefore, this treatment of subject will be confined to principal cause of desiccation in storage as applied to fruits and vegetables packaged in usual moisture-vapor proof containers, together with some suggestions for correcting conditions responsible for this undesirable action.

Importance of flexibility in protective coatings for frozen foods. By Frank D. Bergstein. Refrigerating engineering. v.37,no.5. May, 1939. p.352,356.

Producing frosted foods. Electrical review. v.125,no.3217. July 21, 1939. p.89-90. Promising new field for refrigeration equipment.

Frost Protection.

Frost control problem with special reference to blueberries. By Stanley Johnston. In Michigan agricultural experiment station quarterly bulletin. v.22,no.1. August, 1939. p.3-10.

Glass Fiber.

Strength of glass fiber. By F. O. Anderegg. Industrial and engineering chemistry. Industrial ed. v.31,no.3. March, 1939. p.290-298. Strength of glass is reduced by discontinuities but, by thorough melting and proper methods of attenuation, effect is greatly reduced so that strengths of order of 400,000 pounds per square inch are being produced commercially with fine fibers for textiles. Generally, finer the fiber, greater the strength, the discontinuities apparently being pulled out lengthwise. Strength may be summarized from "bulk" strength plus corrections for decreased cross section. Scatter in strength results of such material as glass is considerable, resulting from variations in number and in severity of discontinuities. Shorter the fiber tested, higher the average results. Breaking is also probably affected by thermal energies which vary from atom to atom. Glasses low in alkali or entirely free of it have extremely high electrical resistance and stand up well to repeated wetting and drying. On other hand, glasses containing alkali seem to withstand most acids quite well. Fused silica has yielded strengths as high as 3,500,000 pounds per square inch.

Hotbeds, Electric.

Method of heating soil. By Arthur Brady. Electrical review. v.125,no.3219. August 4, 1939. p.151. Bare conductors at low voltage. Gives diagram of soil heating arrangement.

Housing.

Cost analysis of three concrete houses. By R. E. Copeland. Concrete. v.47,no.8. August, 1939. p.12,14,23.

Humidity.

Humidity and its control. By Wallace H. Martin. Ice and refrigeration. v.96,no.6. June, 1939. p.515-516.

Hydraulics.

Co-ordination in hydraulics research. Engineering. v.147, no.3833. June 30, 1939. p.787. Valuable work is being carried out in many fields of hydraulics, and international meetings, together with publication of annual bulletins, should promote useful co-ordination in science.

Design of a high-head siphon spillway. By Elmer Rock. American society of civil engineers. Proceedings. v.65,no.4. April, 1939. p.607-618. Direct and clear-cut method

Hydraulics. (Cont'd).

of analysis, for use in determining proportions of high-head siphon spillway, is presented. Manner in which well-established principles of hydraulics are applied is outlined, general equations for determination of throat area and outlet area are derived, and application of method as presented is illustrated by solution of specific problem.

Fundamentals of river and canal hydraulics. By Radha Krishna Khanna. Indian engineering. v.106,no.1. July, 1939. p.32-35.

Hydroponics.

Plants without soil. Land policy review. v.2,no.1. January-February, 1939. p.28-29. Method is hardly likely to have appreciable significance as regards early changes in use of land for agriculture, and therefore for the land use planner.

Insulation.

Cold storage insulation design. By J. F. Stone. Refrigerating engineering. v.37,no.4. April, 1939. p.229-231. While there are many types of cold storages, basic demand made by all upon insulation designer is that he provide for installation which will permit keeping operating costs at minimum. These minimum costs must be maintained at substantially original level of efficiency if installation is to be considered satisfactory. Length of time that insulation must "stand up" depends on type of service and accounting procedure of owner. If service is in industry that changes rapidly, where obsolescence is large factor, than it is not economical to design for extra long life if additional expense is thereby incurred. For same reason, minimum thicknesses of insulation should be used. In plants where change is not rapid, it pays to design and install for long life and efficiency even if some increase of original investment over minimum is required. And in most cases greater thickness of insulation can be shown to be true economy.

Condensation and building insulation. By Frank B. Rowley. Engineering news-record. v.123,no.7. August 17, 1939. p.53-54. Danger of moisture condensation in insulated walls can be eliminated by vapor-proofing the interior surface; merely vapor-proofing exterior surface, as with building paper, accentuates difficulties, according to National Mineral Wood Association tests.

Extruded plastics for insulation of wires. Electrical times. v.96,no.2490. July 13, 1939. p.49-50. New thermoplastic material with valuable chemical and electrical properties. Material used for insulation on wires made by this firm is polyvinyl chloride to which trade name "Tenaplas" has been given. Is

Insulation. (Cont'd).

not attacked by mineral or vegetable oils and alcohols. It is, however, affected to greater or lesser degree by mixtures such as methylene chloride, dichlor-benzole and the ketones. Resists most acids and alkalis in concentrations commonly used in industry, such as hydrochloric acid of any strength, 50 per cent concentrations of nitric and sulphuric acids, ammonia in any concentration, and 20 per cent solutions of caustic potash or soda. Further, insulation is said to withstand normal atmospheric conditions; it will not age or fade in strong sunlight, or if exposed to ultra-violet radiation, while it is also unaffected by ozone. An important feature is that water absorption is practically negligible, and diffusion constant is much superior to that of rubber.

Fire tests of mineral wool insulation. National fire protection association. Quarterly. v.33,no.1. July, 1939. p.55-58. Table gives results of fire tests of wood-stud partitions filled with mineral wool.

Improved insulation with new material--I. By S. L. Brous. Electrical world. v.111,no.20. May 20, 1939. p.76,78. Chemists working with limestone, coke and salt have developed new insulation material for wire and cable industry. "Koroseal" is generic term embracing series of synthetic elastic compositions having many of desirable characteristics of rubber but without many of its disadvantages, and with properties varying from those of hard rubber to those of very soft gel.

Irrigation.

Irrigation for profit. By Larry Moore. Rural electrification exchange. v.2,no.3.(new series). Third quarter, 1939. p.59-60.

Notes on irrigation of certain Cuban soils. By H. G. Sorensen. International sugar journal. v.41,no.488. August, 1939. p.307-311.

Soil moisture control by irrigation. By R. A. Work. Agricultural engineering. v.20,no.9. September, 1939. p.359-362.

Land Utilization.

Land use in New York. By V. B. Hart. Ithaca, N.Y., 1939. 19p. Cornell university. New York state college of agriculture. Bulletin no.406.

Lighting.

Electric light in plant production. Agricultural engineering. v.20,no.9. September, 1939. p.350. Mistaire

Lighting. (Cont'd).

Laboratories at Milburn, New Jersey, introduces method of growing plants for research purposes in jellied chemicals and use of heat-absorbing glass to lower temperature in sunlight.

Lubrication.

Laboratory method for evaluating influence of lubricating oils on carbon deposition in internal combustion engines. By H. A. Everett and G. H. Keller. State College, Penna., 1939. 36p. Pennsylvania state college. Engineering experiment station. Bulletin no.48.

Miscellaneous.

Government spending and economic recovery. By David W. Lusher. Mechanical engineering. v.61,no.4. April, 1939. p.307-308.

Industrial renaissance of the south. By Eugene W. O'Brien. Mechanical engineering. v.61,no.4. April, 1939. p.281-286.

Motor Fuel.

Ignition-quality rating of diesel fuels by commercial engines. By J. S. Chandler. State College, Penna., 1939. 82p. Bibliography: p.80. Pennsylvania state college. Engineering experiment station series. Bulletin no.47.

Tractor fuels. By E. L. Barger. Manhattan, Kansas, 1939. 76p. Bibliography: p.73. Kansas state college. Engineering experiment station. Bulletin no.37.

Oil Burners.

Control methods for domestic conversion gas burners. By L. C. Price. Fayetteville, Ark., 1934. 18p. Processed. University of Arkansas. Engineering experiment station. Bulletin no.12.

Orchard Heaters.

New-type orchard heater. By A. S. Leonard. Mechanical engineering. v.61,no.6. June, 1939. p.443-446. Combustion-chamber bowl-type orchard heater utilizes inert diluents.

Pest Control.

Baits and bait traps in codling moth control. By M. L. Bobb, and others. Blacksburg, Va., 1939. 19p. "Literature cites": p.19. Virginia polytechnic institute. Bulletin no.320.

Plastics.

"Glass" from coal. By Watson Davis. Science news letter. v.36,no.7. August 12, 1939. p.106-107. Natural gas or oil also used with water and air to make clear transparent plastics for new uses.

Plastic automobile. Automotive industries. v.81,no.2. July 15, 1939. p.59,94.

Plastics from wood wastes. By E. C. Jahn. Chemical and metallurgical engineering. v.46,no.4. April, 1939. p.206-207. References, p.207. Author discusses present status of numerous developments of wood plastics that are under way throughout the country. These plastics are particularly interesting for they offer greatest possibility of very low priced plastic product.

Plows and Plowing.

Make no mistake! The new Ford performs. Farm implement news. v.60,no.14. July 13, 1939. p.36-37. Utilizes parallelogram linkage structure controlled by hydraulic piston. His plows were without wheels. Tractor carried them. Hydraulic mechanism pushed them into ground and raised them out.

Poultry Houses - Lighting.

Use of artificial light for poultry. By C. S. Platt. Farmers digest. v.2,no.6. October, 1938. p.66-68.

Use of artificial lights for turkeys. By H. L. Wilcke. Poultry science. v.18,no.3. May, 1939. p.236-243.

Poultry Houses and Equipment.

Brooder houses. By Cora Cooke. St. Paul, Minn., 1939. 12p. University of Minnesota. Agricultural extension division. Bulletin no.198.

Connecticut 24' x 24' poultry house. By R. E. Jones. Storrs, Conn., 1938. 42p. Connecticut state college. Extension service. Bulletin no.266.

Forced ventilation and temperature control for individual laying cage poultry houses. By J. C. Scott. Rural electrification exchange. v.2,no.3(new series). Third quarter, 1939. p.57,66. Gives diagram of installation.

Wisconsin two story poultry house. By S. A. Witzel. Madison, Wisc., 1939. 4p. University of Wisconsin. College of agriculture. Extension service. Circular no.292.

Power Farming.

Recent trends in power and labor costs on Illinois farms. Farm implement news. v.60,no.13. June 29, 1939. p.18. Use and cost of horse labor. Tractor use and costs.

Reclamation.

Land reclamation and shore protection in the Netherlands. By John R. Noyes. Military engineer. v.31,no.177. May-June, 1939. p.212-216.

Refrigerants.

Efficient use of solid carbon dioxide for household refrigeration. By S. C. Collins. Refrigerating engineering. v.37,no.5. May, 1939. p.316. Results in excessively low temperatures but also entails unnecessary thermodynamic losses.

Viscosities of "Freon" refrigerants. By A. F. Benning and W. H. Markwood, Jr. Refrigerating engineering. v.37,no.4. April, 1939. p.243-247.

Refrigeration.

Evaluating food freezing methods. By Wm. J. Finnegan. Refrigerating engineering. v.37,no.6. June, 1939. p.381-383,399. Author makes plea for more exacting terms in relation to quick freezing processes such as contact, convection, air blast, etc. Cites need for exact measurements of heat flow, pointing out variables making it difficult or impossible to predict freezing time from volume of product. Peak loads affecting design are considered briefly. Summary cost of factors affecting choice of a freezing system will be found.

Freezing by immersion: methods and media. By J. G. Woodroof. Refrigerating engineering. v.37,no.6. June, 1939. p.384-387. Paper is progress report on studies of microphysical changes occurring in fruits and vegetables during and subsequent to freezing for preservation. Work was begun at the Georgia experiment station. Ultimate objective is to furnish fundamental information and basic facts for use by those who are or are likely to become engaged in freezing fruits and vegetables particularly in Georgia and neighboring states.

Immersion quick freezing. By John P. Ferris and R. Brooks Taylor. Mechanical engineering. v.61,no.6. June, 1939. p.437-442. Its application to rural processing industry.

Refrigeration of liquids. Refrigerating engineering. v.38,no.1. July, 1939. p.1-8(section 3). Attempts to summarize practice by review of high lights of types of equipment.

Refrigeration. (Cont'd).

Some applications of liquid pre-cooling. By J. G. Hardie. Refrigerating engineering. v.37,no.4. April, 1939. p.235-236. Applications of liquid pre-cooling shown in diagrammatic layout.

Refrigerator Cars.

Recent developments in railway refrigerator cars. By J. L. Townshend. Refrigerating engineering. v.37,no.4. April, 1939. p.226-228,266.

Research.

How to recognize and evaluate a research problem. By John A. Slipher. Agricultural engineering. v.20,no.8. August, 1939. p.309-310.

Organization of agricultural research in Great Britain. Experiment station record. v.81,no.2. August, 1939. p.161-164.

Progress in the organization of the federal research laboratories for new and extended uses of farm commodities. Experiment station record. v.80,no.3. March, 1939. p.289-292.

Regional research laboratories, Department of agriculture. Letter from the Secretary of agriculture transmitting a report of a survey made by the Department of agriculture relative to four regional research laboratories, one in each major farm producing area. Washington, U.S. Govt.print.off., 1939. 429p. 76th Congress, 1st sess. Senate doc. no.65.

Roofs.

Farm building roofs show varied styles. By L. W. Neubauer. Wisconsin agriculturist and farmer. v.66,no.12. June 17, 1939. p.18.

Runoff.

Analysis of run-off characteristics: discussion. By Franklin F. Snyder and W. G. Hoyt. American society of civil engineers. Proceedings. v.65,no.4. April, 1939. p.686-692.

Analysis of run-off characteristics: discussion. By C. S. Jarvis and Howard M. Turner. American society of civil engineers. Proceedings. v.65,no.6. June, 1939. p.1045-1052.

Rainfall and discharge records for Northern Iowa drainage districts. By W. J. Schlick. Ames, Iowa, 1939. 72p. Iowa state college. Engineering experiment station. Bulletin no.141.

Runoff. (Cont'd).

Runoff distribution graphs from precipitation occurring in more than one time unit. By William T. Collins. Civil engineering. v.9,no.9. September, 1939. p.559-561. Method used by Muskingum Watershed Conservancy District in finding sets of coefficients or graphs for runoff distribution, for rain occurring in more than one time interval, may be of interest. This method seems simpler than using least squares, graphical analysis, or other published methods. Means of determining portion of each rain that should be considered as runoff, and manner of plotting distribution graph from its coefficients are also discussed.

Silos.

Report of a silo survey. By Charles H. Reed. Agricultural engineering. v.20,no.8. August, 1939. p.316,319.

Silo types and construction. By J. R. McCalmont. Washington, U.S. Govt.print.off., 1939. 62p. U.S. Department of agriculture. Farmers' bulletin no.1820.

Silt.

Prevention of silt deposition in Channels. By B. M. Bharadwaj. Indian engineering. v.106,no.1. July, 1939. p.29,28.

Soil Moisture.

Soil moisture meter. By F. E. Staebner. Agricultural engineering. v.20,no.8. August, 1939. p.317-318.

Soils.

Chemical study of some soils derived from limestone. By L. T. Alexander and others. Washington, U.S. Govt.print.off., 1939. 27p. "Literature cited":p.27. U.S. Department of agriculture. Technical bulletin no.678.

Engineers study soil behavior: studies in soil behavior to promote safety and economy in the design and construction of building foundations are in progress under the auspices of the Engineering foundation. Canadian engineer. v.76,no.26. June 27, 1939. p.11-12. Full scale observations on new structures are being made in the Philadelphia, Penna., area by committee headed by Professor Gregory P. Tschebotareff of department of civil engineering, Princeton University. Findings will be utilized in the organization of similar investigations on larger scale in other localities.

How accurate are chemical tests of soils in determining plant food availability? By John S. Burd. Pacific rural press. v.137,no.16. April 22, 1939. p.382-383.

Soils. (Cont'd).

Proving rings register soil shear. By Harold A. Fidler. Engineering news-record. v.122,no.23. June 8, 1939. p.78. Steel proving rings adopted for measuring shear resistance in improved shear-testing machine at M.I.T. soils laboratory.

Soil characteristics of Connecticut land types. By M. F. Morgan. New Haven, Conn., 1939. 64p. Connecticut agricultural experiment station. Bulletin no.423.

Soils of Florida. By J. R. Henderson. Gainesville, Fla., 1939. 67p. University of Florida. Agricultural experiment station. Bulletin no.334.

Solar Radiation.

Utilizing solar heat. Mechanical engineering. v.61,no.5. May, 1939. p.388-390. According to Dr. Abbot, we may count on possibility of converting 15 per cent of energy to such solar rays as are intercepted by our devices into mechanical work. Assuming that to avoid appreciable losses through shading one unit by another and, to allow plenty of room for other purposes, only one tenth of area is actually covered by heat collectors, and further allowing for night and cloudy weather, still, he points out, State of New Mexico could supply from solar radiation over ten trillion horsepower-hours per year of mechanical power, which compares with power possibilities of all coal, oil, and water at present used annually for heat, light, and power combined in United States.

Storage of Farm Produce.

Electric sweet potato storage. By Arthur Meyer. Market growers journal. v.64,no.8. April 15, 1939. p.218-219.

Lengthening the storage period of cucumbers. By Jessie Whitacre and others. College Station, Texas, 1939. 23p. "Literature cited":p.23. Texas agricultural experiment station. Bulletin no.576.

Market egg grades as affected by humidity of farm egg storage rooms. By D. C. Kennard and V. D. Chamberlin. Ohio agricultural experiment station. Bimonthly bulletin. v.24,no.199. July-August, 1939. p.126-130.

Potato culture and storage investigations in 1937 and 1938. By E. V. Hardenburg. American potato journal. v.16,no.6. June, 1939. p.143-150. Brief discussion of recent research pertaining to potato culture and storage and attempt to list in bibliographic form many references which could not be reviewed at this time.

Some storage diseases of fruits. By Charles Brooks. Refrigerating engineering. v.37,no.5. May, 1939. p.313-315,340.

Surveying.

First- and second- order triangulation in Michigan (1927 datum). By G. L. Fentress. Washington, U.S. Govt.print.off., 1939. 427p. U.S. Coast and geodetic survey. Special publication no.214.

Spirit leveling in Missouri. Part 6. Northeastern Missouri, 1896-1938. By J. G. Staack. Washington, U.S. Govt.print.off., 1939. 869p. Processed. U.S. Geological survey. Bulletin no.898-F.

Terracing.

Terrace outlets and farm drainageways. By C. L. Hamilton. Washington, U.S. Govt.print.off., 1939. 46p. U.S. Department of agriculture. Farmers' bulletin no.1814.

Tractors.

Electrically driven garden tractor. By K. R. Frost. Rural electrification. v.4,no.12. August, 1939. p.3-4. Gives cross section of electractor showing motor, transmission, rotating miller, cable reel, and controls. Advantages of electric tractor are: 1. Vibrationless operation; 2. quietness; 3. easy starting; 4. fewer mechanical troubles; 5. lower operating cost; 6. eliminates gases and oils that may damage flowers and plants; 7. simple speed-reduction unit.

Ford makes a new tractor and implements. Automotive industries. v.81,no.2. July 15, 1939. p.66-67. Details: four-cylinder L-head engine; horsepower, 23 at 1400 r.p.m.; displacement, 120 cu. in.; forward speeds, 2-1/2, 3-1/4 and 6 m.p.h.; reverse speed, 2-3/4 m.p.h.; overall length, 115 in.; overall width, 64 in.; height, 52 in.

Jacklin tests traction; Nebraska tests tractors. Automotive industries. v.81,no.4. August 15, 1939. p.147-148.

Tractors come to family-sized farm. Fertilizer review. v.14,no.4. July-August, 1939. p.6-7,12.

Tung Oil.

Southern tung oil laboratories. By R. S. McKinney. Manufacturers record. v.108,no.8. August, 1939. p.54.

Walls.

Avoiding cracks in building walls. By Fred N. Severud. Engineering news-record. v.123,no.1. July 6, 1939. p.45-46. Epidemic of cracks in brick bearing walls of large number of completed public housing projects has focused attention on this

Walls. (Cont'd).

recurrent problem. Crack forming phenomenon is explained as function of concrete floor slab shrinkage. Recognition of interplay of stresses in different materials used to form single structural unit is basic to crack control. Horizontal concrete bands around each story and vertical concrete struts at corners and between windows are effective.

Puddled-earth and rammed-earth walls. By Ralph L. Patty. Agricultural engineering. v.20,no.8. August, 1939. p.311-312,319.

Structural properties of a concrete-block cavity-wall construction sponsored by the National concrete masonry association. By H. L. Whittemore and others. Washington, U.S. Govt.print.off., 1939. 10p. U.S. National bureau of standards. Building materials and structures. Report BMS21.

Waste Products.

New uses for old products. Consumers' guide. v.6,no.5. July, 1939. p.9-11. While farmers seek to get a fairer share of consumers' dollars by adjusting their production, scientists in laboratories are helping to increase farmers' income by finding new ways to utilize old products and prevent waste. Science alone cannot solve agriculture's problems, but it is showing how it can help.

Some potential industrial opportunities in the utilization of agricultural wastes in Alabama. By C. A. Basore. Auburn, Ala., 1939. 14p. "References":p.14. Alabama polytechnic institute. Engineering experiment station. Bulletin no.10.

Turning waste into wealth. Consumers' guide. v.6,no.6. August, 1939. p.10-12. More new uses for farm products and waste products, discovered each year, show how science is making agriculture important in industry as well as in food and feed production.

Water, Utilization of.

Amount of water required to grow a crop. By William Peterson. Utah farmer. v.59,no.1. July 15, 1939. p.3,22.

Utilization of water by alfalfa (Medicago Sativa) and by bluegrass (Poa Pratensis) in relation to managerial treatments. By V. G. Sprague and L. F. Graber. Journal of the American society of agronomy. v.30,no.12. December, 1938. p.986-997. Purpose of experiment has been to determine if such variable field responses of bluegrass and alfalfa to moisture deficits may be, in part, matter of difference in water utilization resulting from variations in managerial treatments

Water, Utilization of. (Cont'd).

of top growth and variations in nutritional levels. Designation "water requirement" as used in paper refers to ratio of amount of water utilized by plant to dry matter produced by plant exclusive of subterranean parts.

Water Conservation.

Conservation by silt lining of ditches. By Thomas Williamson. Reclamation era. v.29;no.6. June, 1939. p.138,143.
Describes procedure and results of demonstration of conservation by silt lining of distribution ditch; and outlines suggested program for thorough examination and demonstration of possibilities of method, and for developing of principles and technique for its practical application.

Water Heaters.

Evaluating performance of water heaters fired with solid fuels. By H. J. Rose and R. C. Johnson. Heating, piping and air conditioning. v.11,no.7. July, 1939. p.457-460.
Paper briefly describes methods by which solid-fuel-fired water heaters (for domestic hot-water supply) may be tested for maximum and minimum output, flexibility of output or response to control, maximum attention intervals and efficiency. Combined drawoff and banking test is described which simulates household demands, and gives good idea of over-all performance which can be expected in actual use. Field installations of water heaters based on knowledge gained by these tests have proved satisfactory, in comparison with previous methods of water heating used in same homes.

Water Power.

Water power in Nebraska. By V. T. Boughton. Engineering news-record. v.122,no.17. April 17, 1939. p.54-58.
For past five years Nebraska has been engaged in building group of combined power and irrigation projects that has been widely characterized as "a little TVA" having no economic justification. General character of those projects is given in following article, the acute water question is discussed, and present indications as to power markets are outlined as result of a first-hand study of two projects now in operation and project now under construction.